Listing of Claims:

This listing of claims reflects all claim amendments and replaces all prior versions, and listings, of claims in the application (material to be inserted in amended claims is in **bold and underline**, and material to be deleted is in ~~strikeout~~).

Please cancel claims 45-52 without prejudice.

Please add new claims 53-56 as set out below.

Claims 1-17 (Canceled).

Claim 18 (Withdrawn).

Claims 19-24 (Canceled).

Claims 25-36 (Withdrawn).

Claims 37-44 (Canceled).

Claims 45-52. (Canceled).

53. (New) An apparatus for distilling heavy isotopes from a vapor or a liquid constituted by a plurality of isotopes, comprising:

a plurality of distillation columns constructed in a cascade,

wherein each of the columns comprises a reboiler and a condenser;

a liquid drawn from each of the columns being introduced into the reboiler;

a vapor drawn from each of the columns being introduced into the condenser;

an outlet of the reboiler of the first column is directly connected to an inlet of the condenser of the second column via introduction conduits, which introduce a portion of

a vapor drawn from the reboiler of the first column into the condenser of the second column;

the outlet of the reboiler of the first column is connected to the first column by means of a conduit which returns another portion of the vapor drawn from the reboiler to the first column;

an outlet of the condenser of the second column is directly connected to an inlet of the reboiler of the first column via return conduits, which return a portion of a liquid drawn from the condenser of the second column into the reboiler of the first column; and

the outlet of the condenser of the second column is connected to the second column by means of a conduit which returns another portion of the liquid drawn from the condenser to the second column.

54. (New) An apparatus according to claim 53, wherein at least one of said columns is a packed column or a wetted wall column;

wherein the packed column uses structured packing that is promoting-fluid-dispersion structured packing or non-promoting-fluid-dispersion structured packing, where the promoting-fluid-dispersion structured packing comprises a plurality of wave-shaped thin plates disposed parallel to the column axis and made into the form of a block by layering the plates so that they come into contact with one another, and the non-promoting-fluid-dispersion structured packing comprises a honeycomb structure or a lattice structure;

wherein the honeycomb structure comprises plates parallel to the direction of the

axis of the column; and

the lattice structure comprises a plurality of mutually parallel plates and a plurality of plates which are arranged at right angles with respect to said mutually parallel plates, and the mutually parallel plates which are arranged at right angles are positioned along the direction of the column axis.

55. (New) An apparatus according to claim 53, further comprising a hydrogenation device that adds hydrogen to the liquid or vapor drawn from one of the columns.

56. (New) An apparatus according to claim 53, further comprising an isotope scrambler that enriches an isotope-enriched liquid or vapor drawn from at least one of said columns, wherein said isotope scrambler is connected to a conduit that returns the isotope-enriched liquid or vapor to at least one of said columns.